

**WHAT IS CLAIMED IS:**

- 1 1. A method of continuously manufacturing tubular filter products, said method comprising:  
2 rotating a mandrel in a first rotational direction;  
3 depositing nonwoven fibers on the mandrel to form a tubular body; and  
4 continuously withdrawing the tubular body from the mandrel by engaging a peripheral surface  
5 of the tube with one or more detents extending radially from a surface of a roller, the roller  
6 rotating in a direction substantially opposite said first rotational direction as said one or more  
7 detents engage said tubular body to a predetermined depth relative to said mandrel.
- 1 2. The method of claim 1, wherein said peripheral surface comprises the outer surface of a fully  
2 formed tubular body.
- 1 3. The method of claim 1 further comprising covering said peripheral surface with additional  
2 nonwoven fibers.
- 1 4. The method of claim 1, wherein said roller includes multiple detents.
- 1 5. The method of claim 4, wherein said multiple detents extend radially to equal distances from  
2 said surface of the roller.
- 1 6. The method of claim 5, wherein said multiple detents are uniformly distributed about said  
2 roller.
- 1 7. A tubular filter product comprising a plurality of melt blown fibers formed into a tubular body  
2 defining an outer surface and an inner surface, said tubular body further defining a pattern of  
3 cavities.
- 1 8. The tubular filter product of claim 7, wherein said cavities are enclosed between melt blown  
2 fibers of said outer surface and said inner surface.
- 1 9. The tubular filter product of claim 7, wherein said cavities comprise exposed recesses  
2 extending into one of said inner and outer surfaces.

1 10. The tubular filter product of claim 7 wherein localized areas corresponding to said cavities are  
2 of greater melt blown fiber density per unit volume than an average melt blown fiber density  
3 per unit volume associated with the tubular filter product.

1 11. An apparatus for continuously producing a tubular filter product, the apparatus comprising:  
2 a melt blowing die assembly for expelling melt blown fibers;  
3 a rotating mandrel arranged to receive the melt blown fibers from the melt blowing die  
4 assembly for allowing the melt blown fibers to accumulate in a tubular body thereon; and  
5 a rotating roll having an outer surface with at least one detent protruding therefrom, the roll  
6 arranged so that said detent comes within a predetermined distance of the mandrel for contacting  
7 the tubular body of melt blown fibers in a manner forcing the melt blown fibers accumulated in  
8 the tubular body on the mandrel to move in a direction parallel to the mandrel.

1 12. The apparatus of claim 11, wherein said rotating mandrel extends adjacent said melt blowing  
2 die assembly to define a fiber receiving portion of said mandrel and said rotating roll is arranged  
3 to contact said melt blown fibers of said tubular body at a location corresponding to said fiber  
4 receiving portion.

1 13. The apparatus of claim 11 wherein the rotating roll has a plurality of detents protruding from  
2 said outer surface.

1 14. The apparatus of claim 13 wherein said detents are uniformly distributed about said outer  
2 surface of said roller.